

**U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
U ANALYSES**

REPORT OF SAMPLE DELIVERY GROUP #1100243

Project: Dimock Residential GW Site, Dimock, PA
Analysis method: Actinides (Uranium) by Extraction Chromatography
Report ID: 1100243-U
Report type: Original
Date reported: 04/05/2012
Total pages in report: 38

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B2.01194D	FB01	PA:DIMOCK	WATER-DRINKING	01/23/2012	01/26/2012
B2.01195E	HW19	PA:DIMOCK	WATER-DRINKING	01/23/2012	01/26/2012
B2.01196F	HW19-P	PA:DIMOCK	WATER-DRINKING	01/23/2012	01/26/2012
B2.01197G	FB05	PA:DIMOCK	WATER-DRINKING	01/27/2012	01/31/2012
B2.01198H	HW24-P	PA:DIMOCK	WATER-DRINKING	01/27/2012	01/31/2012
B2.01199J	FB03	PA:DIMOCK	WATER-DRINKING	01/25/2012	01/31/2012
B2.01200H	HW01	PA:DIMOCK	WATER-DRINKING	01/25/2012	01/31/2012
B2.01201J	HW02	PA:DIMOCK	WATER-DRINKING	01/25/2012	01/31/2012
B2.01202K	HW02Z	PA:DIMOCK	WATER-DRINKING	01/25/2012	01/31/2012
B2.01203L	HW08A	PA:DIMOCK	WATER-DRINKING	01/25/2012	01/31/2012
B2.01204M	HW04	PA:DIMOCK	WATER-DRINKING	01/24/2012	01/31/2012
B2.01205N	HW05	PA:DIMOCK	WATER-DRINKING	01/26/2012	01/31/2012
B2.01206P	HW12	PA:DIMOCK	WATER-DRINKING	01/26/2012	01/31/2012
B2.01207Q	HW14	PA:DIMOCK	WATER-DRINKING	01/26/2012	01/31/2012
B2.01208R	HW14-P	PA:DIMOCK	WATER-DRINKING	01/26/2012	01/31/2012
B2.01209T	FB04	PA:DIMOCK	WATER-DRINKING	01/26/2012	01/31/2012
B2.01210K	EB01	PA:DIMOCK	WATER-DRINKING	01/28/2012	01/31/2012
B2.01211L	HW17	PA:DIMOCK	WATER-DRINKING	01/27/2012	01/31/2012
B2.01212M	HW24	PA:DIMOCK	WATER-DRINKING	01/27/2012	01/31/2012
B2.01213N	FB02	PA:DIMOCK	WATER-DRINKING	01/24/2012	01/31/2012

EXCEPTIONS

1. **Packaging and shipping** – No problems were observed.
2. **Documentation** – No problems were observed.
3. **Sample preparation** – No problems were encountered.
4. **Analysis** -- Originally, sample B2.01202 had a yield that was below the lower acceptance limit. The sample was reanalyzed, and the results are reported in this data package. In addition, samples B2.01197 and B2.01197 DUP were loaded into the detectors incorrectly. The information was corrected to reflect the correct detector ID and its associated data with the correct sample.
5. **Holding times** – No holding times were specified.

QUALITY CONTROL

1. **QC samples** – All QC analysis results met NAREL acceptance criteria.
2. **Yields** – All chemical yields were within acceptance limits.
3. **Instruments** – Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

CERTIFICATION

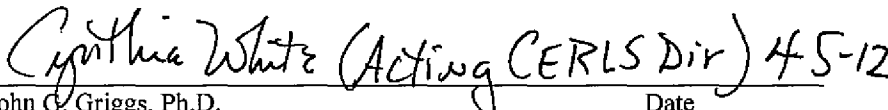
I certify that this data report complies with the terms and conditions of the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.



Mary F. Wisdom
Quality Assurance Manager, NAREL

4-10-12

Date



John G. Griggs, Ph.D.
Director, Center for Environmental Radioanalytical
Laboratory Science

Date

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample (blank spike)
MS	Matrix spike
MSD	Matrix spike duplicate
RBK	Method blank

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "Z scores." A Z score is the number of standard deviations by which the QC result differs from its ideal value. The score is considered acceptable if its absolute value is not greater than 3.

The Z score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference.

The Z score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference. When the precision of paired MS/MSD analyses is evaluated, the native sample activity is subtracted from each measured value and the net concentrations are then converted to total activities before the Z score is computed.

Each standard uncertainty used to compute a Z score includes an additional fixed term to represent sources of measurement error other than counting error. This additional term is not used in the evaluation of reagent blanks.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation.

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NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

ANALYSIS SUMMARY

Analysis Procedure: NAREL U-EICHROM
Title: Actinides (Uranium) by Extraction Chromatography

NAREL Sample #	QC Type	Preparation Procedure	Date Completed	Assay Batch #	QC Batch #
B2.01194D	DUP	N/A	03/16/2012	0015805J	0008532A
B2.01195E		N/A	03/14/2012	0015798D	0008532A
B2.01196F		N/A	03/14/2012	0015798D	0008532A
B2.01197G		N/A	03/14/2012	0015798D	0008532A
B2.01197G		N/A	03/14/2012	0015798D	0008532A
B2.01198H		N/A	03/14/2012	0015798D	0008532A
B2.01199J		N/A	03/14/2012	0015798D	0008532A
B2.01200H		N/A	03/15/2012	0015798D	0008532A
B2.01201J		N/A	03/14/2012	0015798D	0008532A
B2.01202K		N/A	04/04/2012	0015850P	0008597U
B2.01203L		N/A	03/14/2012	0015798D	0008532A
B2.01204M		N/A	03/14/2012	0015798D	0008532A
B2.01205N		N/A	03/16/2012	0015805J	0008532A
B2.01206P		N/A	03/16/2012	0015805J	0008532A
B2.01207Q		N/A	03/16/2012	0015805J	0008532A
B2.01208R		N/A	03/16/2012	0015805J	0008532A
B2.01209T		N/A	03/16/2012	0015805J	0008532A
B2.01210K		N/A	03/16/2012	0015805J	0008532A
B2.01211L		N/A	03/16/2012	0015805J	0008532A
B2.01212M		N/A	03/16/2012	0015805J	0008532A
B2.01213N		N/A	03/16/2012	0015805J	0008532A
B2.02561L *	DUP	N/A	04/04/2012	0015850P	0008597U
B2.02561L *		N/A	04/04/2012	0015850P	0008597U
LCS-00632939K *	LCS	N/A	03/16/2012	0015805J	0008532A
RBK-00632938J *	RBK	N/A	03/16/2012	0015805J	0008532A
LCS-00634463C *	LCS	N/A	04/04/2012	0015850P	0008597U
RBK-00634462B *	RBK	N/A	04/04/2012	0015850P	0008597U

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

PREPARATION METHOD(S) USED

Procedure ID	Title

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01194D	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015805J
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	Aqueous		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS33	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	5.99e-02	7.1e-02	1.0e-01	PCI/L	03/15/2012 15:55 CDT
U235	2.05e-02	5.6e-02	1.0e-01	PCI/L	03/15/2012 15:55 CDT
U238	1.71e-02	4.7e-02	8.4e-02	PCI/L	03/15/2012 15:55 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01195E	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015798D
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/13/2012 14:24	1000.0	AS73	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	3.12e-01	1.4e-01	1.3e-01	PCI/L	03/13/2012 14:24 CDT
U235	-4.56e-03	5.4e-02	1.3e-01	PCI/L	03/13/2012 14:24 CDT
U238	1.52e-01	9.0e-02	7.5e-02	PCI/L	03/13/2012 14:24 CDT

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NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01196F	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015798D
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/13/2012 14:24	1000.0	AS74	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234 *	2.83e-01	1.2e-01	6.6e-02	PCI/L	03/13/2012 14:24 CDT
U235	2.75e-02	4.9e-02	5.9e-02	PCI/L	03/13/2012 14:24 CDT
U238	1.41e-01	9.1e-02	9.5e-02	PCI/L	03/13/2012 14:24 CDT

* An asterisk indicates a result that may be significantly under or overestimated

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01197G	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015798D
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	Aqueous		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/13/2012 14:24	1000.0	AS78	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	5.10e-02	7.1e-02	1.1e-01	PCI/L	03/13/2012 14:24 CDT
U235	-1.11e-02	3.8e-02	1.1e-01	PCI/L	03/13/2012 14:24 CDT
U238	1.21e-01	9.5e-02	1.1e-01	PCI/L	03/13/2012 14:24 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01197G	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015798D
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	DUP
Sample description:	N/A		
Comment:	Aqueous		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/13/2012 14:24	1000.0	AS79	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	4.14e-02	5.8e-02	8.8e-02	PCI/L	03/13/2012 14:24 CDT
U235	1.80e-02	4.9e-02	8.9e-02	PCI/L	03/13/2012 14:24 CDT
U238	4.14e-02	5.2e-02	6.5e-02	PCI/L	03/13/2012 14:24 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01198H	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015798D
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/13/2012 14:24	1000.0	AS80	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	7.58e-02	6.9e-02	7.8e-02	PCI/L	03/13/2012 14:24 CDT
U235	1.91e-02	5.2e-02	9.4e-02	PCI/L	03/13/2012 14:24 CDT
U238	6.39e-02	6.5e-02	7.8e-02	PCI/L	03/13/2012 14:24 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01199J	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015798D
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	Aqueous		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/13/2012 14:24	1000.0	AS81	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	4.54e-02	6.3e-02	8.9e-02	PCI/L	03/13/2012 14:24 CDT
U235	1.63e-02	4.7e-02	7.1e-02	PCI/L	03/13/2012 14:24 CDT
U238	3.63e-02	5.6e-02	7.8e-02	PCI/L	03/13/2012 14:24 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01200H	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015798D
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/14/2012 15:51	1000.0	AS82	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	8.35e-02	8.0e-02	8.4e-02	PCI/L	03/14/2012 15:51 CDT
U235	3.53e-02	6.2e-02	7.6e-02	PCI/L	03/14/2012 15:51 CDT
U238	4.42e-02	6.9e-02	1.1e-01	PCI/L	03/14/2012 15:51 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01201J	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015798D
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/13/2012 14:24	1000.0	AS83	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	3.53e+00	5.2e-01	7.6e-02	PCI/L	03/13/2012 14:24 CDT
U235	7.46e-02	8.0e-02	9.1e-02	PCI/L	03/13/2012 14:24 CDT
U238	1.09e+00	2.6e-01	7.6e-02	PCI/L	03/13/2012 14:24 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01202K	QC batch #:	0008597U
Matrix:	WATER-DRINKING	Assay batch #:	0015850P
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
04/03/2012 11:44	1000.0	AS97	RCL

ANALYTICAL RESULTS

Analyte		Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	*	3.39e+00	4.9e-01	7.2e-02	PCI/L	04/03/2012 11:44 CDT
U235	*	1.45e-01	1.0e-01	8.6e-02	PCI/L	04/03/2012 11:44 CDT
U238	*	1.37e+00	2.9e-01	9.1e-02	PCI/L	04/03/2012 11:44 CDT

* An asterisk indicates a result that may be significantly under or overestimated

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01203L	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015798D
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/13/2012 14:24	1000.0	AS85	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	1.89e-01	1.1e-01	7.9e-02	PCI/L	03/13/2012 14:24 CDT
U235	2.77e-02	6.0e-02	9.5e-02	PCI/L	03/13/2012 14:24 CDT
U238	5.54e-02	6.3e-02	6.0e-02	PCI/L	03/13/2012 14:24 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01204M	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015798D
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/13/2012 14:24	1000.0	AS86	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	6.19e-01	2.0e-01	6.5e-02	PCI/L	03/13/2012 14:24 CDT
U235	2.41e-02	6.6e-02	1.2e-01	PCI/L	03/13/2012 14:24 CDT
U238	5.29e-01	1.9e-01	6.5e-02	PCI/L	03/13/2012 14:24 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01205N	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015805J
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS35	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	3.25e+00	4.9e-01	8.7e-02	PCI/L	03/15/2012 15:55 CDT
U235	4.78e-02	6.5e-02	6.9e-02	PCI/L	03/15/2012 15:55 CDT
U238	1.30e+00	2.9e-01	7.6e-02	PCI/L	03/15/2012 15:55 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01206P	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015805J
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS36	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	2.18e+00	3.8e-01	9.4e-02	PCI/L	03/15/2012 15:55 CDT
U235	6.25e-02	7.1e-02	6.7e-02	PCI/L	03/15/2012 15:55 CDT
U238	8.34e-01	2.2e-01	5.6e-02	PCI/L	03/15/2012 15:55 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01207Q	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015805J
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS37	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234 *	2.70e-01	1.2e-01	8.3e-02	PCI/L	03/15/2012 15:55 CDT
U235	2.02e-02	5.5e-02	9.9e-02	PCI/L	03/15/2012 15:55 CDT
U238	1.64e-01	9.6e-02	5.5e-02	PCI/L	03/15/2012 15:55 CDT

* An asterisk indicates a result that may be significantly under or overestimated

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01208R	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015805J
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS38	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234 *	2.71e-01	1.3e-01	1.1e-01	PCI/L	03/15/2012 15:55 CDT
U235	-5.32e-03	5.1e-02	1.2e-01	PCI/L	03/15/2012 15:55 CDT
U238	2.00e-01	1.1e-01	9.6e-02	PCI/L	03/15/2012 15:55 CDT

* An asterisk indicates a result that may be significantly under or overestimated

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01209T	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015805J
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	Aqueous		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS41	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	3.15e-02	5.6e-02	8.9e-02	PCI/L	03/15/2012 15:55 CDT
U235	0.00e+00	3.4e-02	7.0e-02	PCI/L	03/15/2012 15:55 CDT
U238	2.25e-02	4.9e-02	7.7e-02	PCI/L	03/15/2012 15:55 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01210K	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015805J
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	Aqueous		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS48	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	7.25e-02	6.9e-02	7.3e-02	PCI/L	03/15/2012 15:55 CDT
U235	-5.11e-03	3.4e-02	8.8e-02	PCI/L	03/15/2012 15:55 CDT
U238	4.27e-02	5.9e-02	8.4e-02	PCI/L	03/15/2012 15:55 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01211L	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015805J
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS73	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	2.65e+00	4.0e-01	1.3e-01	PCI/L	03/15/2012 15:55 CDT
U235	3.53e-02	6.9e-02	1.2e-01	PCI/L	03/15/2012 15:55 CDT
U238	1.51e+00	2.8e-01	7.2e-02	PCI/L	03/15/2012 15:55 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01212M	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015805J
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS74	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	6.03e-02	5.7e-02	6.1e-02	PCI/L	03/15/2012 15:55 CDT
U235	3.82e-02	5.2e-02	5.5e-02	PCI/L	03/15/2012 15:55 CDT
U238	3.55e-02	5.5e-02	8.8e-02	PCI/L	03/15/2012 15:55 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.01213N	QC batch #:	0008532A
Matrix:	WATER-DRINKING	Assay batch #:	0015805J
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	Aqueous		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS78	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	5.07e-02	7.1e-02	1.1e-01	PCI/L	03/15/2012 15:55 CDT
U235	2.21e-02	6.0e-02	1.1e-01	PCI/L	03/15/2012 15:55 CDT
U238	-1.84e-02	3.4e-02	1.1e-01	PCI/L	03/15/2012 15:55 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.02561L	QC batch #:	0008597U
Matrix:	WATER-DRINKING	Assay batch #:	0015850P
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

This sample is not in SDG #1100243

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
04/03/2012 11:44	1000.0	AS101	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234 *	8.75e-02	8.0e-02	9.1e-02	PCI/L	04/03/2012 11:44 CDT
U235 *	0.00e+00	3.5e-02	7.2e-02	PCI/L	04/03/2012 11:44 CDT
U238 *	6.45e-02	6.9e-02	7.9e-02	PCI/L	04/03/2012 11:44 CDT

* An asterisk indicates a result that may be significantly under or overestimated

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	B2.02561L	QC batch #:	0008597U
Matrix:	WATER-DRINKING	Assay batch #:	0015850P
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

This sample is not in SDG #1100243

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
04/03/2012 11:44	1000.0	AS102	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	5.46e-02	6.2e-02	5.9e-02	PCI/L	04/03/2012 11:44 CDT
U235	3.27e-02	5.8e-02	7.1e-02	PCI/L	04/03/2012 11:44 CDT
U238	2.27e-02	4.9e-02	7.8e-02	PCI/L	04/03/2012 11:44 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	LCS-00632939K	QC batch #:	0008532A
Matrix:	N/A	Assay batch #:	0015805J
Sample type:	N/A	Prep procedure:	N/A
Amount analyzed:	1.000e+00 SAMP	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS79	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	2.20e+00	2.2e-01	2.1e-02	PCI	03/15/2012 15:55 CDT
U235	9.37e-02	3.7e-02	2.1e-02	PCI	03/15/2012 15:55 CDT
U238	2.14e+00	2.2e-01	1.5e-02	PCI	03/15/2012 15:55 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	RBK-00632938J	QC batch #:	0008532A
Matrix:	N/A	Assay batch #:	0015805J
Sample type:	N/A	Prep procedure:	N/A
Amount analyzed:	1.000e+00 SAMP	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
03/15/2012 15:55	1000.0	AS99	GVJ

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234	2.16e-03	9.6e-03	1.9e-02	PCI	03/15/2012 15:55 CDT
U235	3.87e-03	1.1e-02	1.7e-02	PCI	03/15/2012 15:55 CDT
U238	0.00e+00	1.0e-02	2.3e-02	PCI	03/15/2012 15:55 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	LCS-00634463C	QC batch #:	0008597U
Matrix:	N/A	Assay batch #:	0015850P
Sample type:	N/A	Prep procedure:	N/A
Amount analyzed:	1.000e+00 SAMP	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
04/03/2012 11:44	1000.0	AS109	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234 *	1.93e+00	2.1e-01	1.7e-02	PCI	04/03/2012 11:44 CDT
U235 *	8.22e-02	3.7e-02	2.1e-02	PCI	04/03/2012 11:44 CDT
U238 *	1.94e+00	2.1e-01	1.7e-02	PCI	04/03/2012 11:44 CDT

* An asterisk indicates a result that may be significantly under or overestimated

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100243

SAMPLE ANALYSIS REPORT

Sample #:	RBK-00634462B	QC batch #:	0008597U
Matrix:	N/A	Assay batch #:	0015850P
Sample type:	N/A	Prep procedure:	N/A
Amount analyzed:	1.000e+00 SAMP	Analysis procedure:	NAREL U-EICHROM
Dry/wet weight:	N/A	Analyst:	AS
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
04/03/2012 11:44	1000.0	AS110	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
U234 *	1.16e-02	1.3e-02	1.2e-02	PCI	04/03/2012 11:44 CDT
U235 *	2.31e-03	1.0e-02	2.0e-02	PCI	04/03/2012 11:44 CDT
U238 *	9.64e-04	8.8e-03	1.9e-02	PCI	04/03/2012 11:44 CDT

* An asterisk indicates a result that may be significantly under or overestimated

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG 1100243

QC BATCH SUMMARY

QC batch #: 0008532A
Preparation procedure: N/A
Analysis procedure: NAREL U-EICHRON

NAREL Sample #	QC Type	Yield (%)	$\pm 2 \sigma$ Uncertainty (%)	Analyst
B2.01194D	DUP	89.32 %	7.52 %	AS
B2.01195E		81.90 %	6.62 %	AS
B2.01196F		80.40 %	6.50 %	AS
B2.01197G		82.58 %	7.13 %	AS
B2.01197G		82.30 %	6.63 %	AS
B2.01198H		75.70 %	6.20 %	AS
B2.01199J		83.28 %	7.14 %	AS
B2.01200H		77.85 %	6.84 %	AS
B2.01201J		85.75 %	7.30 %	AS
B2.01203L		84.88 %	7.32 %	AS
B2.01204M		78.70 %	6.98 %	AS
B2.01205N		84.92 %	7.23 %	AS
B2.01206P		83.44 %	7.05 %	AS
B2.01207Q		89.96 %	7.53 %	AS
B2.01208R		86.08 %	7.34 %	AS
B2.01209T		82.90 %	7.08 %	AS
B2.01210K		87.64 %	7.36 %	AS
B2.01211L		84.73 %	6.78 %	AS
B2.01212M		86.59 %	6.85 %	AS
B2.01213N		83.16 %	7.16 %	AS
LCS-00632939K *	LCS	87.13 %	6.90 %	AS
RBK-00632938J *	RBK	87.66 %	7.39 %	AS

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG 1100243

QC BATCH SUMMARY

QC batch #: 0008597U
Preparation procedure: N/A
Analysis procedure: NAREL U-EICHROM

NAREL Sample #	QC Type	Yield (%)	$\pm 2 \sigma$ Uncertainty (%)	Analyst
B2.01202K		90.15 %	7.53 %	AS
B2.02561L *		82.92 %	7.14 %	AS
B2.02561L *	DUP	85.43 %	7.32 %	AS
LCS-00634463C *	LCS	91.28 %	7.54 %	AS
RBK-00634462B *	RBK	101.11 %	8.25 %	AS

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

**National Air and Radiation Environmental Laboratory
QC Batch Report**

QC Batch #: 0008532A

Analytical Method: NAREL U-EICHROM

METHOD BLANKS (PCI)

Sample ID	Nuclide	Activity $\pm 2\sigma$	Prep Date	Flags
00632938J	U234	$2.16e-03 \pm 9.6e-03$	2012-03-08	OK
00632938J	U235	$3.87e-03 \pm 1.1e-02$	2012-03-08	OK
00632938J	U238	$0.00e+00 \pm 1.0e-02$	2012-03-08	OK

LABORATORY DUPLICATES (PCI/L)

Sample ID	Nuclide	Original $\pm 2\sigma$	Duplicate $\pm 2\sigma$	RPD	Z
B2.01197G	U234	$5.10e-02 \pm 7.1e-02$	$4.14e-02 \pm 5.8e-02$	20.74	-0.21 OK
B2.01197G	U235	$-1.11e-02 \pm 3.8e-02$	$1.80e-02 \pm 4.9e-02$	840.77	0.93 OK
B2.01197G	U238	$1.21e-01 \pm 9.5e-02$	$4.14e-02 \pm 5.2e-02$	97.71	-1.46 OK

LAB CONTROL SAMPLES (PCI)

Sample ID	Nuclide	Amt Added $\pm 2\sigma$	Measured $\pm 2\sigma$	%R	Z
00632939K	U234	$1.96e+00 \pm 2.2\%$	$2.20e+00 \pm 2.2e-01$	112.15	2.10 OK
00632939K	U235	$9.39e-02 \pm 2.2\%$	$9.37e-02 \pm 3.7e-02$	99.84	-0.01 OK
00632939K	U238	$2.04e+00 \pm 2.2\%$	$2.14e+00 \pm 2.2e-01$	104.88	0.90 OK

Analyst:

Albert Smith 3/22/2012

QA Officer:

Kevin J. McLean 3/22/12

National Air and Radiation Environmental Laboratory
QC Batch Report

QC Batch #: 0008597U

Analytical Method: NAREL U-EICHROM

METHOD BLANKS (PCI)

Sample ID	Nuclide	Activity $\pm 2\sigma$	Prep Date	Flags
00634462B	U234	$1.16e-02 \pm 1.3e-02$	2012-03-28	J
00634462B	U235	$2.31e-03 \pm 1.0e-02$	2012-03-28	J
00634462B	U238	$9.64e-04 \pm 8.8e-03$	2012-03-28	J

LABORATORY DUPLICATES (PCI/L)

Sample ID	Nuclide	Original $\pm 2\sigma$	Duplicate $\pm 2\sigma$	RPD	Z
B2.02561L	U234	$8.75e-02 \pm 8.0e-02$	$5.46e-02 \pm 6.2e-02$	46.43	-0.65 OK
B2.02561L	U235	$0.00e+00 \pm 3.5e-02$	$3.27e-02 \pm 5.8e-02$	200.00	0.97 OK
B2.02561L	U238	$6.45e-02 \pm 6.9e-02$	$2.27e-02 \pm 4.9e-02$	95.78	-0.99 OK

LAB CONTROL SAMPLES (PCI)

Sample ID	Nuclide	Amt Added $\pm 2\sigma$	Measured $\pm 2\sigma$	%R	Z
00634463C	U234	$1.96e+00 \pm 2.2\%$	$1.93e+00 \pm 2.1e-01$	98.49	-0.27 OK
00634463C	U235	$9.39e-02 \pm 2.2\%$	$8.22e-02 \pm 3.7e-02$	87.59	-0.62 OK
00634463C	U238	$2.04e+00 \pm 2.2\%$	$1.94e+00 \pm 2.1e-01$	95.30	-0.88 OK

Analyst:

Albert Smith
Smith, Albert

4/4/2012

QA Officer:

Carl J. McEwen

4/5/12

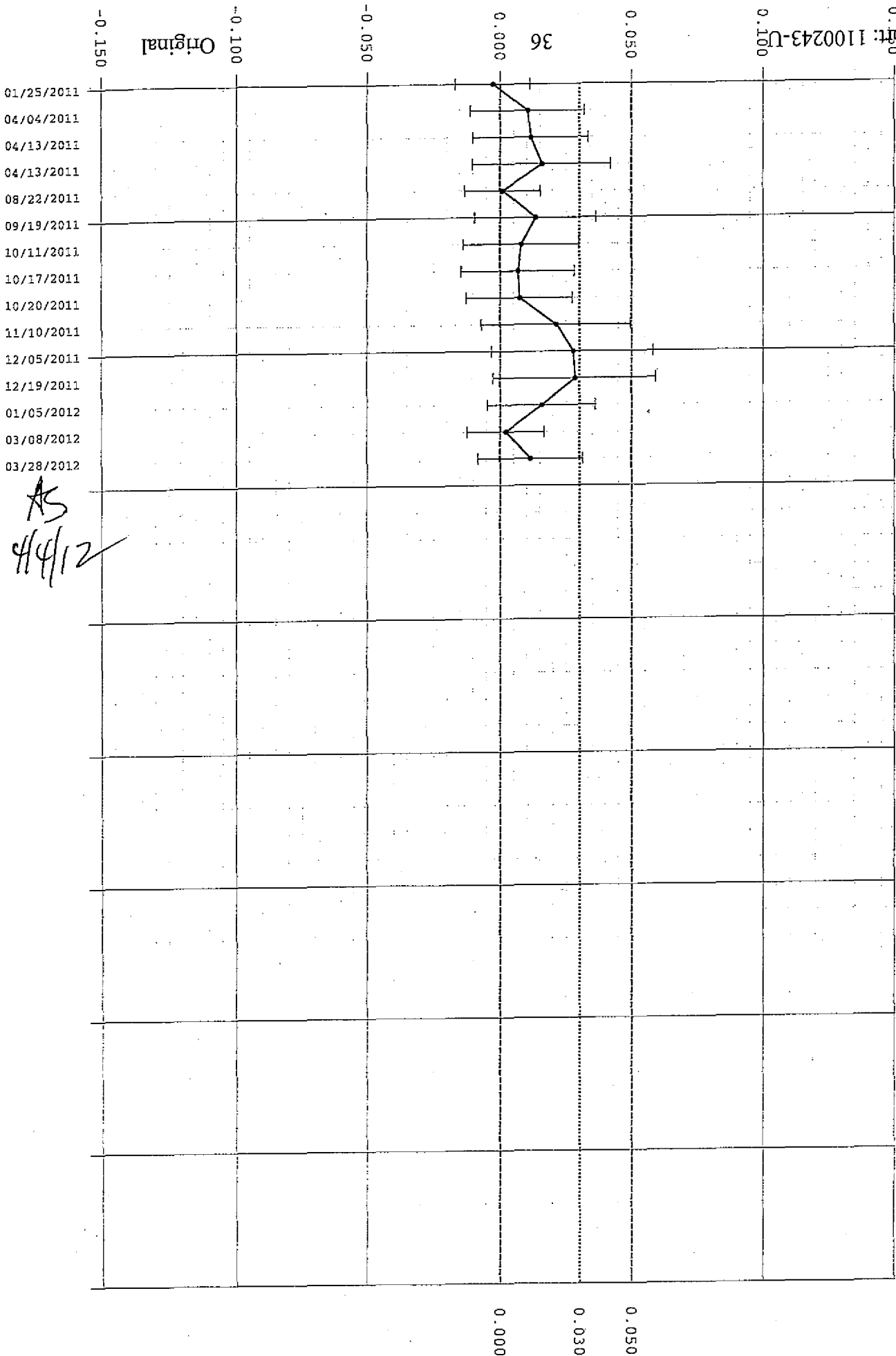
Method Blanks

Analyte: U234

Method: NAREL U-EICHIROM

Analyst: Smith, Albert

Report: 1100243-U



Original

AS
4/4/12

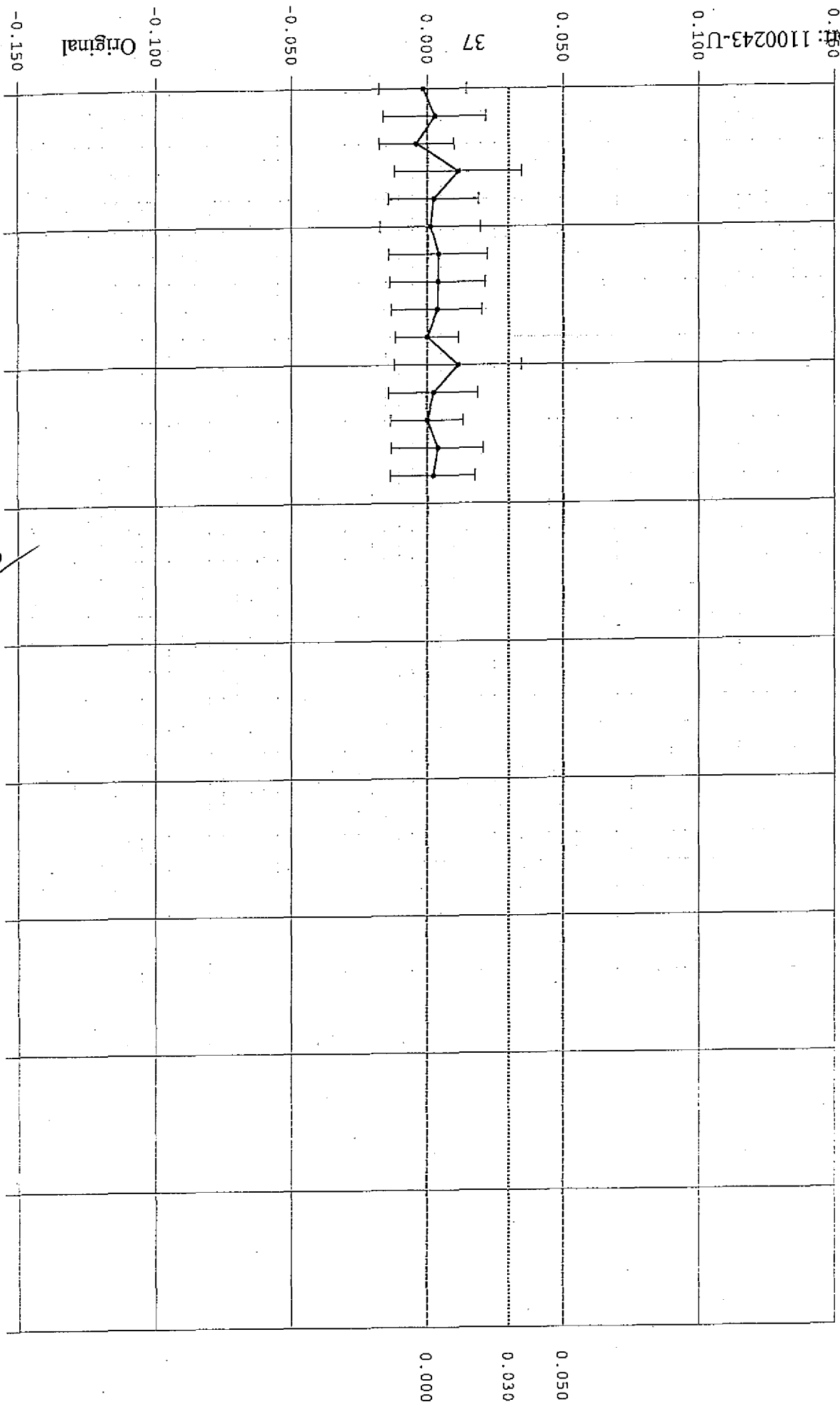
Method Blanks

Analyte: U235

Method: NAREL U-EICHRON

Analyst: Smith, Albert

Report: 1100243-U



Original

AS
4/4/12

Method Blanks
 Analyte: U238
 Method: NAREL U-EICHIROM
 Analyst: Smith, Albert

